EXHIBIT 20

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NORTH DAKOTA**

TURTLE MOUNTAIN BAND OF CHIPPEWA INDIANS, et al.,	
Plaintiffs,	
v.	Civil No. 3:22-cv-00022-PDW-ARS
ALVIN JAEGER, in his official capacity as Governor of the State of North Dakota, et al.,	
Defendant.	

DECLARATION TO ACCOMPANY THE EXPERT REPORT OF WESTON MCCOOL

Pursuant to 28 U.S.C. § 1746, I, Weston McCool, declare that:

My name is Weston McCool. I am an expert witness designated by Plaintiffs in the above referenced case now pending in the United States District Court for the District of North Dakota.

A true and correct copy of my curriculum vitae is attached hereto as a part of my report. The following report, a true and correct copy of which is attached and incorporated herein for all purposes, is a summary of my opinions and conclusions. The materials I relied upon to develop my analyses and opinions are cited therein and/or produced herewith for all counsel.

The court testimony and publications I am required to disclose are described in my attached report and/or curriculum vitae.

My reasonable and necessary hourly rate for my time in this case is $200.

I declare under penalty of perjury that the foregoing is true and correct.

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Signed this 30th day of November, 2022

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Weston McCool, Ph.D

Expert Witness Report
In the case of
Turtle Mountain Band of Chippewa Indians v. Jaeger
U.S. District Court for the District of North Dakota, Eastern Division
prepared by:

Weston C. McCool, Ph.D.
Department of Anthropology
University of Utah
November 2022

OUTLINE OF THE REPORT

Summary of Findings:

Seven socioeconomic variables were selected for this analysis: income, poverty, education, health insurance coverage, computer ownership and internet access, home ownership, and employment (see results in Table 1). The data for these variables were compared for: (1) AIAN residents of Rolette County versus White residents of Rolette County, (2) AIAN residents of Benson County versus White residents of Benson County, and (3) AIAN residents of Ramsey County versus White residents of Ramsey County, for a total 21 separate quantitative socioeconomic tests. In all cases

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where statistics were compiled, the AIAN population is statistically significantly at a disadvantage when compared to Whites. AIAN residents earn substantially less household income compared to Whites, AIAN residents are significantly more likely to earn an income under the poverty line compared to Whites, they are overrepresented in lower levels of educational attainment, and underrepresented in higher levels of educational attainment, AIAN households are significantly less likely to own a computer or have access to broadband internet compared to Whites, they are less likely to own their home, less likely to have health insurance coverage, and more likely to be unemployed. These race-based disparities are, in a word, systemic. For every socioeconomic variable used, AIAN populations are systemically and significantly at a socioeconomic disadvantage compared to their White neighbors, which hinders their ability to participate in the political process (Senate Report 1982).

I. INTRODUCTION

1. Qualifications

I am a National Science Foundation Postdoctoral Research Fellow in the Anthropology Department at the University of Utah. My formal education includes a BS (2009) in Anthropology from the University of Utah, two MAs (2013, 2015) in Archaeology from the University of Utah and University of California, Santa Barbara, respectively, and a Ph.D. (2020) in Archaeology from the University of California, Santa Barbara.

I have extensive experience in quantitative methods, including spatial, environmental, socioeconomic, demographic, and statistical modeling including the use of geospatial (GIS) methods. My formal research program focuses on investigating the relationship between changing social and environmental conditions and human decision making, particularly as it relates to

human conflict and migration. My research has produced a dozen published articles in major peer-reviewed scientific journals such as *Nature*, *Nature Communications*, *Proceedings of the National Academy of the Sciences*, *Nature Scientific Reports*, *PLOS ONE*, *The Journal of Biological Anthropology*, and more, all of which involve social, demographic, and/or spatial modeling. I have been hired by the plaintiffs for this case and I am compensated at the rate of $200/hour. The results and conclusions I reach in this report are mine alone, are not related to or endorsed by the University where I have an appointment and were reached through an independent process of research and inquiry.

2. Quantitative Socioeconomic Methods

All data used for the quantitative socioeconomic analysis were derived from (1) the 2015-2019 five-year American Community Survey (ACS) for North Dakota, and (2) the Kaiser Family Foundation's State Health Facts Report (for the healthcare avoidance due to cost variable). ACS racial variables in the socioeconomic analysis are American Indian and Alaskan Native-alone (henceforth, AIAN) and non-Hispanic White-alone (henceforth, White). These demographic variables are preferable to the "race in combination with one or more other races" variable as it includes White and AIAN individuals that would either have to be dropped from the analysis or would be counted twice as they would be lumped into both racial categories for the socioeconomic analyses. Estimates in this analysis incorporate the margin of errors (MOE) given in the ACS detailed tables. All variable estimates include the MOE by listing the upper and lower estimates, the MOE range, and the differences in the MOE ranges between AIAN and White estimates. This "MOE difference" variable compares errors between AIAN and White estimates to determine whether the comparative errors wash out. All statistical analyses were conducted in the R

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programming environment (R Core Team 2020), which is an open-source programming language used as a statistical software and data analysis tool.

The quantitative methods in this report rely on descriptive and inferential statistics to present data findings and assess whether observed differences in socioeconomic factors are statistically significant and not due to the vagaries of data sampling or random error. The descriptive and inferential statistics used here are standard practice in quantitative analysis and common in every introductory statistics course.

Statistical tests are warranted for the socioeconomic analysis because they evaluate whether the census survey data (samples) are representative of the population at large – the demographic we are interested in evaluating. Without statistical tests we cannot determine whether the observed differences or similarities between the sampled data are representative of some characteristic of the population as a whole and not due to sampling error. Statistical significance is defined here using the established social science alpha parameter of alpha < 0.05 (McKillup 2006). In other words, for a test to be considered statistically significant it must have less than a 5% probability that the observed effect is the result of sampling error. When a statistical test used in this report yields a p-value (the probability of attaining the observed results) of < 0.05, we can conclude that the observed effect is representative of the population as a whole and reject the null-hypothesis. For each of the tests in this report, the null hypothesis is that there are no differences in the socioeconomic variables based on race.

We rely on one type of inferential statistical test: The Chi Squared Test of Independence, which produces a statistic that measures the difference between the observed and expected frequencies of an outcome for a set of variables to determine whether they are independent of one another. For example, if a county consists of 50 White residents and 50 AIAN residents, and

unemployment is 50%, we expect 25 White residents (50%) and 25 AIAN residents (50%) to be unemployed, these are our "expected" values. If in fact only 10 White residents (10%) are unemployed while 40 AIAN residents (80%) are unemployed (or vice-versa), we can see that the "observed" values do not match our expected values. The Chi Square Test of Independence tests whether the differences between expected and observed values are statistically significantly different, and what the probability is that the difference is due to sampling error.

II. THE SENATE FACTORS APPLIED TO NORTH DAKOTA

3. Socioeconomic Analysis

1. Rolette County

Seven variables are evaluated in this socioeconomic analysis. As the MOE difference between AIAN population and the Rolette County White population is small for each of the seven analyses (Table 1), we conduct statistical tests only on the primary variable estimates, rather than the lower and upper estimates.

1a. Rolette County and the Turtle Mountain Reservation Demography

The total estimated population for the Turtle Mountain Reservation is 9,247, while the total population estimate for the broader Rolette County is 14,511, with 11,325 AIAN residents and 2,633 White residents (Figure 1).
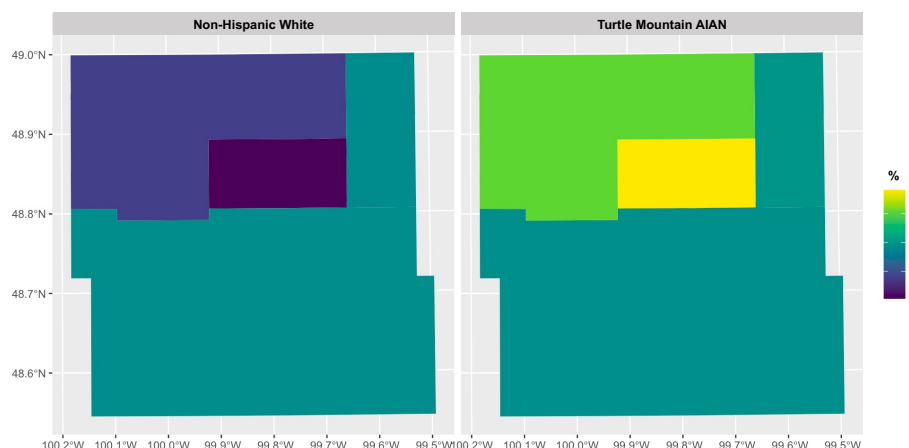
Figure 1. A Census Tract map of the 2019 5-year ACS racial distribution of AIAN and White population in Rolette County, North Dakota. The map includes the Turtle Mountain Reservation population.

1b. Median Household Income

The median income for AIAN households in Rolette County is $37,750, while median household income for Whites is $60,556. These data show a large race-based discrepancy in income, with White households earning substantially more than AIAN households.

1c. Poverty

In Rolette County, 31.5% of AIAN households are below the poverty line compared to 6.0% of White households. This difference is statistically significant ($X^2 = 694.37$, p-value <0.001), with AIAN households significantly overrepresented below the poverty line compared to Whites. Put another way, we have greater than 99.9% confidence that that the sample of income data is representative of the population as a whole and that the null hypothesis (no relationship between race and poverty) can be rejected. A similar degree of confidence is present in all subsequent statistical tests.

1d. Educational Attainment

For the AIAN population 37.3% of adults 25-years and older have a high school diploma or did not complete high school, compared to 40% of Whites. 17.3% of the AIAN population earned a

college degree, compared to 26.5% of Whites. There are statistically significant differences in educational attainment by race, with the AIAN population significantly ($X^2 = 165.85$, p-value <0.001) overrepresented in lower educational attainment categories and underrepresented in higher educational attainment categories when compared to Whites.

1e. Computer Ownership and Broadband Internet Access

In the AIAN community, 86.5% of households own a computer, while 72.2% of households have access to broadband internet. For Rolette White households, 89.2% own a computer and 76.1% have access to broadband internet. Both differences are statistically significant (computer ownership $X^2 = 13.339$, p-value = 0.0003; Internet Access $X^2 = 16.172$, p-value <0.001), with AIAN households having reduced access to computers and the internet compared to Whites.

1f. Home Ownership, Value and Rent Payments

Home ownership also shows substantial bias, as 69.3% of the AIAN population owns a home compared to 78.4% of the Rolette White population. This difference is statistically significant ($X^2 = 33.734$, p-value <0.001), with the AIAN population significantly underrepresented in home ownership compared to Rolette Whites.

1g. Health Insurance Coverage

In Rolette County, 29.2% of AIAN residents do not have health insurance coverage, compared to 7.7% of Whites in Rolette County. This difference is statistically significant ($X^2 = 510.01$, p-value <0.001), with AIAN residents significantly less likely to have health insurance coverage relative to Whites. Native Americans can also access free or reduced cost healthcare without health insurance through Indian Health Service (IHS) programs. But statewide data from North Dakota suggest that IHS is not making up for disparate access to health insurance coverage among Native Americans and Whites. Despite access to IHS services, AIAN in North Dakota, who are over

nearly four times more likely than whites to be uninsured, are also over three times more likely than whites to report that they avoided care due to cost, with 3.9% of Whites reporting not seeing a doctor because of cost, compared to 13.9% of AIAN according to the Kaiser Family Foundation's State Health Facts report. While these are state-wide data, they are the best available data on health care avoidance due to cost.

1h. Employment

Of those in the labor pool, 10.3% of AIAN population is unemployed compared to 2.5% of the Rolette White population. This difference is statistically significant ($X^2 = 80.742$, p-value <0.001), with AIAN residents more likely to be unemployed relative to the White population.

2. Benson County

As with section one of the socioeconomic analysis, I evaluate seven variables.

2a. Benson County Demography

According to the 2019 5-year ACS survey, the total population of Benson County, North Dakota is 6,860. Of those, 2,794 are White and 3,696 are AIAN (Figure 2).
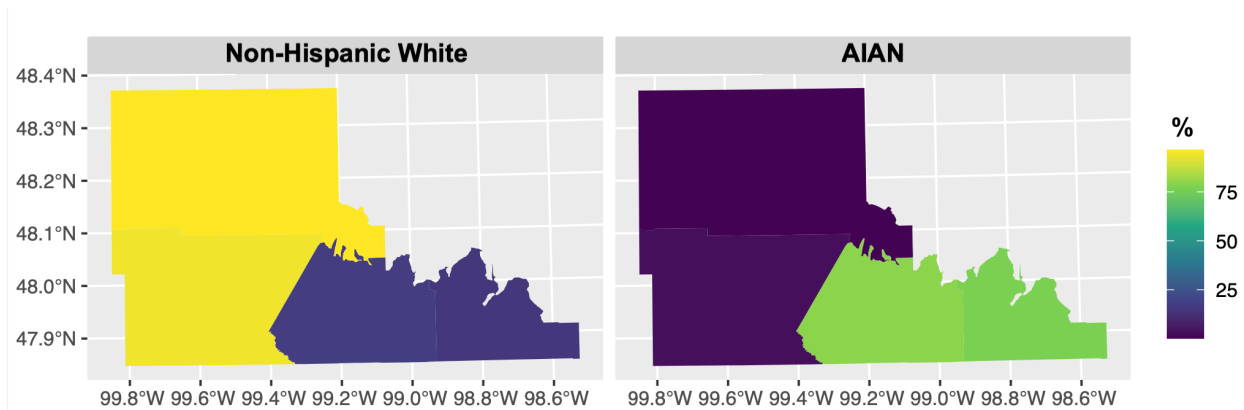

Figure 2. A Census Tract map of the 2019 ACS racial distribution of AIAN and White population in Benson County, North Dakota.

2b. Median Household Income

Median income for AIAN households in $28,795, compared to $68,785 for Benson County White households. The MOE difference is negligible, showing a marked income disparity that disadvantages the AIAN community.

2c. Poverty

49.8% of the AIAN population income is below the poverty line, compared to 8.9% of Whites. This difference is statistically significant (X^2 = 1219.2, p-value <0.001), showing the AIAN population is overrepresented below the poverty line compared to Whites.

2d. Educational Attainment

54.7% of AIAN adults 25-years and older have attained a high school degree or less, compared to 34.6% of Whites. Only 6% of AIAN adults 25-years and older have earned a college degree, compared to 24.7% of Whites. These differences are statistically significant (X^2 = 365.36, p-value <0.001), with AIAN adults significantly underrepresented in higher levels of educational attainment and overrepresented in lower levels of educational attainment compared to Whites.

2e. Computer Ownership and Broadband Internet Access

71.3% of AIAN household own a computer compared to 90.5% of White households. 41.3% of AIAN households have access to broadband internet compared to 78.2% of White households. Both differences are statistically significant (computer ownership X^2 = 360.55, p-value <0.001; internet access X^2 = 889.28, p-value <0.001), with AIAN households having significantly reduced computer ownership and internet access compared to Whites.

2f. Home Ownership

45.3% of AIAN households own their home compared to 82.4% of White households. This difference is statistically significant (X^2 = 327.23, p-value <0.001), with the AIAN population

significantly less likely to own their home and significantly more likely to rent their home compared to Whites.

2g. Health Insurance Coverage

15.9% of the AIAN population has no health insurance coverage, compared to 4.4% of Whites. This difference is statistically significant ($X^2 = 215.73$, p-value <0.001), with AIAN individuals significantly less likely to have health insurance coverage compared to Whites. Native Americans can also access free or reduced cost healthcare without health insurance through Indian Health Service (IHS) programs. However, statewide data from North Dakota suggest that IHS is not making up for disparate access to health insurance coverage among Native Americans and Whites. Despite access to IHS services, AIAN in North Dakota, who are over nearly four times more likely than whites to be uninsured, are also over three times more likely than whites to report that they avoided care due to cost, with 3.9% of Whites reporting not seeing a doctor because of cost, compared to 13.9% of AIAN according to the Kaiser Family Foundation's State Health Facts report. While these are state-wide data, they are the best available data on health care avoidance due to cost.

2h. Employment

Of those in the labor pool, 11.3% of the AIAN population in unemployed, compared to 2.9% of Whites. This difference is statistically significant ($X^2 = 71.001$, p-value <0.001), with unemployment significantly higher among the AIAN population compared to Whites.

3. Ramsey County

3a. Ramsey County Demography

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According to the 5-year ACS survey, the population of Ramsey County, North Dakota is 11,521. Of these, 9,640 are White-alone and 1,108 are AIAN (Figure 3).
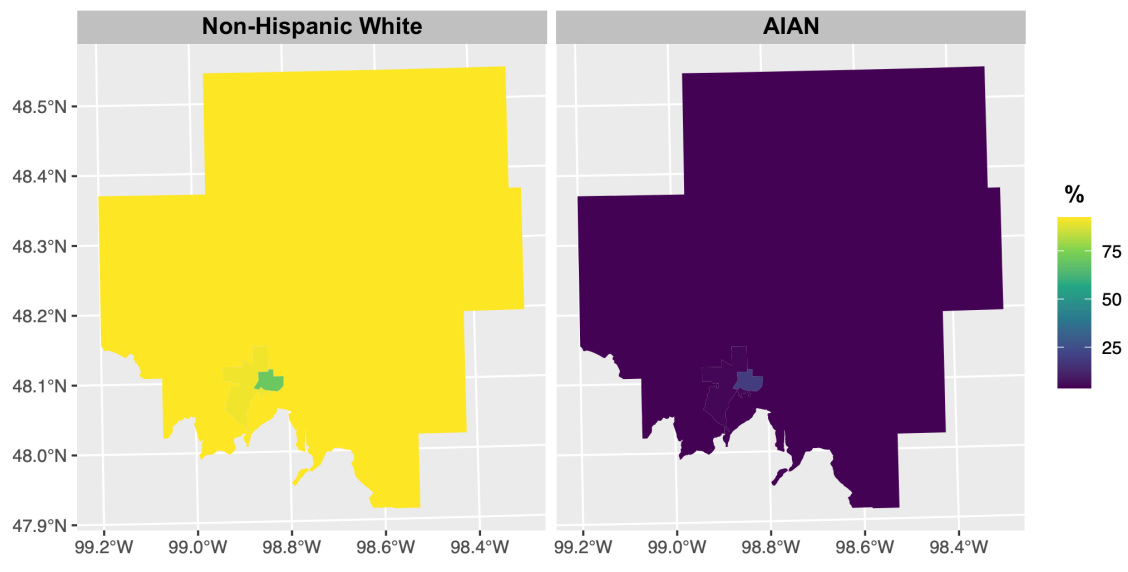
Figure 3. A Census Tract map of the 2019 ACS racial distribution of AIAN and White population in Ramsey County, North Dakota.

3b. Median Household Income

Medina income for AIAN households in Ramsey County is $37,000 compared to $62,252 for Whites. While the MOE is quite large for these estimates, the lower and upper estimates are not overlapping, meaning that White median household income is substantial higher than AIAN income regardless of the margin of error in the estimates.

3c. Poverty

27.5% of the AIAN household income is under the poverty line, compared to 9% for White households. This difference is statistically significant ($X^2 = 362.95$, p-value <0.001). White MOE is substantial, it is largely non-overlapping indicating that regardless of the margin of error, poverty is greater among AIAN household compared to White households.

3d. Educational Attainment

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55.5% of AIAN adults 25-years and older have attained a high school degree or less, compared to 35% of Whites. Only 6.8% of AIAN adults have attained a college degree compared to 27.6% for Whites. These differences are statistically significant (X^2 = 171.88, p-value <0.001) although the large MOEs for the less than high school and high school degree educational attainment categories render this result somewhat tentative. The much lower MOE for the college-level attainment category strongly indicates AIAN adults 25-years and older are significantly less likely to earn a college degree compared to Whites.

3e. Computer Ownership and Broadband Internet Access

84.6% of AIAN households own a computer compared to 91.5% of White households. 65.4% of AIAN households have access to broadband internet compared to 85.9% of White households. Both differences are statistically significant (Computer Ownership X^2 = 58.201, p-value <0.001; Internet Access X^2 = 319.71, p-value <0.001), showing AIAN households have significantly reduced access to computers and the internet. High MOEs however render these results somewhat tentative.

3f. Home Ownership

16.6% of AIAN residents own their home compared to 65.7% of White residents. This difference is statistically significant (X^2 = 324.36, p-value <0.001), with AIAN residents significantly more likely to rent their home and less likely to own comparted to Whites. While the MOEs are large, they are non-overlapping, indicating these results are valid.

3g. Health Insurance Coverage

20.5% of AIAN residents have no health insurance coverage, compared to 4.0% of White residents. This difference is statistically significant (X^2 = 522.69, p-value <0.001), with AIAN residents significantly less likely to have health insurance. Large MOEs render this result

somewhat tentative. Native Americans can also access free or reduced cost healthcare without health insurance through Indian Health Service (IHS) programs. But statewide data from North Dakota suggest that IHS is not making up for disparate access to health insurance coverage among Native Americans and Whites. Despite access to IHS services, AIAN in North Dakota, who are over nearly four times more likely than whites to be uninsured, are also over three times more likely than whites to report that they avoided health care due to cost, with 3.9% of Whites reporting not seeing a doctor because of cost, compared to 13.9% of AIAN according to the Kaiser Family Foundation's State Health Facts report. While these are state-wide data, they are the best available data on care avoidance due to cost.

3h. Employment

2.3% of AIAN residents are unemployed, compared to 0.43% of White residents. This difference is statistically significant ($X^2 = 21.744$, p-value <0.001), with AIAN residents significantly more likely to be unemployed compared to White residents. While large MOEs show the lower estimates for AIAN and White residents are the same, the upper estimates deviate substantially, suggesting the bias towards greater AIAN unemployment may be higher than the primary estimate suggests.

III. CONCLUSION

For all analyses, there is race-based bias that disadvantages the AIAN population when compared to Whites. These differences are statistically significant across the board, and systemic in nature. Table one provides a complete overview of the descriptive and inferential statistics for more quantitative context. These systemic disparities hinder the ability of AIAN tribal members to participate effectively in the North Dakota political process (Senate Report 1982).

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Variable	Rolette AIAN	lower estimate	upper estiamte	MOE range	Rolette White	lower estimate	upper estiamte	MOE range	MOE difference	p-value
Median household income	$37,750	$33,669	$41,831	$8,162	$60,556	$53,870	$67,242	$13,372	$5,210	NA
Below poverty Level	31.50%	27.00%	36.10%	9.10%	6.00%	4.60%	7.60%	3.00%	-6.10%	<0.001
EDU: High School or lower	37.30%	26.50%	43.30%	16.80%	40.0%	30.60%	49.40%	18.80%	2.00%	<0.001
EDU: College degree	17.30%	13.60%	21.30%	7.70%	26.50%	21.70%	31.30%	9.60%	1.90%	<0.001
Owns a computer	86.50%	83.40%	89.60%	6.20%	89.20%	86.00%	92.40%	6.40%	0.20%	0.0003
Broadband internet	72.20%	67.4%	76.90%	9.50%	76.10%	71.50%	80.80%	9.30%	-0.20%	0.0003
Owns a home	69.30%	65.10%	73.60%	8.50%	78.40%	71.70%	85.20%	13.50%	5.00%	<0.001
No health insurance	29.20%	25.2%	35.30%	10.10%	7.70%	4.50%	11.0%	6.50%	-3.60%	<0.001
Unemployed	10.30%	6.1%	15.00%	8.90%	2.50%	0.0%	3.70%	3.70%	-5.20%	<0.001
Variable	Benson AIAN	lower estimate	upper estiamte	MOE range	Benson White	lower estimate	upper estiamte	MOE range	MOE difference	p-value
Median household income	$28,795	$24,711	$32,879	$8,168.00	$61,445	$57,856	$65,034	$7,178	-$990.00	NA
Below poverty level	49.80%	44.10%	55.60%	11.50%	8.90%	6.60%	11.20%	4.60%	-6.90%	<0.001
EDU: High School or lower	54.70%	44.40%	65%	20.60%	34.60%	28.90%	40.40%	11.50%	-9.10%	<0.001
EDU: College degree	6%	3.40%	8.60%	5.20%	24.70%	20.80%	28.60%	7.80%	2.60%	<0.001
Owns a computer	71.30%	66.60%	76%	9.40%	90.50%	88.70%	92.30%	3.60%	-5.80%	<0.001
Broadband internet	41.30%	36.50%	46.10%	9.60%	78.20%	74.80%	81.60%	6.80%	-2.80%	<0.001
Owns a home	45.30%	39.80%	50.70%	10.90%	82.40%	78.90%	85.90%	7.00%	-3.90%	<0.001
No health insurance	15.90%	11.70%	20.00%	8.30%	4.40%	2.90%	6.30%	3.40%	-4.90%	<0.001
Unemployed	11.30%	6.20%	19.10%	12.90%	2.90%	1.40%	6.10%	4.70%	-8.20%	<0.001
Variable	Ramsey AIAN	lower estimate	upper estiamte	MOE range	Ramsey White	lower estimate	upper estiamte	MOE range	MOE difference	p-value
Median household income	$37,000	$29,992	$44,008	$14,016	$62,252	$56,890	$67,614	$10,724	-$3,292	NA
Below poverty level	27.50%	15.20%	39.80%	24.60%	9%	6.30%	11.70%	5.40%	-19.20%	<0.001
EDU: High School or lower	55.50%	14.90%	87.30%	72.40%	35.00%	27.30%	42.60%	15.30%	-57.10%	<0.001
EDU: College degree	6.80%	0%	17.20%	17.20%	27.80%	23%	32.60%	9.60%	-7.60%	<0.001
Owns a computer	84.60%	66.4%	100%	33.60%	91.50%	89.20%	93.80%	4.60%	-29.00%	<0.001
Broadband internet	65.40%	43.50%	87.30%	43.80%	85.90%	83.00%	88.90%	5.90%	-37.90%	<0.001
Owns a home	16.60%	2.90%	30.20%	27.30%	65.70%	61.40%	70.10%	8.70%	-18.60%	<0.001
No health insurance	20.50%	2.00%	40.30%	38.30%	4.0%	2.10%	6%	3.80%	-34.50%	<0.001
Unemployed	2.30%	0%	17%	17.10%	0.43%	0%	1.40%	1.40%	-15.70%	<0.001

Table 1. Descriptive and inferential statistics for all seven socioeconomic variables including primary estimates and margin of errors (MOE) for the three counties.

Weston Craig McCool	**Curriculum Vitae**

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Appointments

2021-present   Postdoctoral Fellow, National Science Foundation SPRF program. Sponsoring Scientist: Dr. Brian Codding. Affiliated institution: University of Utah, Dept. of Anthropology.

2020-2021   Postdoctoral Researcher, University of California at Santa Barbara, Dept. of Anthropology. Sponsoring Scientist: Dr. Douglas J. Kennett.

Education

Ph.D. Anthropology, University of California at Santa Barbara, 2020
M.A. Anthropology, University of California at Santa Barbara, 2015
M.A. Anthropology, University of Utah, 2013
B.S. Anthropology, University of Utah, 2009

Research Expertise

Environmental archaeology	
Bioarchaeology	Geospatial modeling
Climate change	Statistical modeling
Inequality	Big data
Conflict	Isotope chemistry
Settlement patterns and demography	Peruvian Andes
Dietary reconstructions	North American Southwest

Publications

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2018   **McCool, Weston C.**, Joan Brenner-Coltrain. **A potential oxygen isotope signature of maize beer consumption: An experimental pilot study**. *Journal of Ethnoarchaeology 10*(1): 56-67.

2017   **McCool, Weston C. Coping with Conflict: Defensive strategies and chronic warfare in the Prehispanic Nasca region**. *Latin American Antiquity 28*(3): 373-393.

2015   Parker, Bradley J., **Weston C. McCool**. **Indices of household maize beer production in the Andes: An ethnoarchaeological investigation**. *Journal of Anthropological Research 71*(3): 359-400.

In Progress

In-Review   **McCool, Weston C. Migration, settlement, and warfare in the Nasca highlands of Peru**. Edited volume to be named.

In-Review   **McCool, Weston C.**, Brian F. Codding. **Homicide rates in the United States increase when and where resources are scarce and unequally distributed**. *Evolution and Human Behavior.*

In-Prep   **McCool, Weston C.**, Kurt M. Wilson, Brian F. Codding, Amy Anderson, Alexis J. Baide. **Divergent climatic and demographic stressors predict high rates of morbidity in the Prehispanic central Andes**. In: *The Dynamic Influences of Climate Change on Prehistoric Lifeways in the Americas* (Eds., Wilson, K.M., McCool, W.C.), Quaternary International Special Issue.

In-Prep   Yaworsky, Peter M., Kenneth B. Vernon, **Weston C. McCool**, Brian F. Codding. **Land use patterns of the west Tavaputs Plateau driven by population expansion and contraction during the Formative Period**. In: *The Dynamic Influences of Climate Change on Prehistoric Lifeways in the Americas* (Eds., Wilson, K.M., McCool, W.C.), Quaternary International Special Issue.

In-Prep   Vernon, Kenneth B., **Weston C. McCool**, Brian F. Codding. **Settlement adaptations to varying climate among Fremont farmers in Utah**. In: *The Dynamic Influences of Climate Change on Prehistoric Lifeways in the Americas* (Eds., Wilson, K.M., McCool, W.C.), Quaternary International Special Issue.

In-Prep   Wilson, Kurt M., **Weston C. McCool**, Joan Brenner Coltrain. **Climatic influences on subsistence intensification along the coasts of the prehispanic Central Andes**. In:

The Dynamic Influences of Climate Change on Prehistoric Lifeways in the Americas (Eds., Wilson, K.M., McCool, W.C.), Quaternary International Special Issue.

In-Prep   Arkush, Elizabeth, **Weston C. McCool**, Ryan Smith. **The Late Intermediate period in the south-central highlands: Key problems in timing**. In: *Leveraging Radiocarbon in the Central Andes: From Chronologies to Research Agendas* (Eds., Contreras, D., Marsh, E., Rademaker, K.), Quaternary International Special Issue.

In-Prep   **McCool, Weston C.**, Kenneth B. Vernon, Peter M. Yaworsky, Brian F. Codding. **The archaeology of warfare needs a general theory of behavior**. Target journal: *Evolutionary Anthropology*.

Technical reports

2022   Bruce M. Pavlik, Lisbeth A. Louderback, Brian F. Codding, Kenneth Blake Vernon, Heidi M. Simper, **Weston C. McCool**, and Stefania Wilks. **Archaeo-ecosystems of the four corners: Ethnobotanical surveys of Puebloan sites, San Juan County, Utah, project year 3**. Report submitted to the Bureau of Land Management, Monticello, UT.

Popular press and University press releases

2022   **Violence of abundance**, by Jim Logan. The Current. https://www.news.ucsb.edu/2022/020634/violence-abundance

2022   **Climate change induced refugee crisis, chronic war, in ancient Peru**, by Lisa Potter. *The U*. https://attheu.utah.edu/facultystaff/climate-change-nasca-highlands/

2022   **Violenza sociale e conflitto: figli soltanto dei cambiamenti climatici?**, By Sofia Belardinelli. Universita DiPadova. https://ilbolive.unipd.it/it/news/violenza-sociale-conflitto-figli-soltanto

2022   **Climate drove 7000 years of dietary changes**, by Lisa Potter. *The U*. https://attheu.utah.edu/facultystaff/climate-drove-dietary-changes/

2021   **Google maps for time travelers**, By David Malakoff. *American Archaeology Magazine,* 25(2). Magazine article about McCool and Yaworsky 2019.

2021   **A history of violence**, By Jim Logan. *The Current*. https://www.news.ucsb.edu/2021/020225/history-violence

Field and Lab Experience

2021-present   PI: Climate and Conflict in the Ancient Southwest Project.

2018-present   PI: Nasca Highlands Life History Project.

2018-present   PI: Nasca Highlands Warfare Project.

2017-present   Collaborator: Fremont Agriculture and Risk Project (Dr. Peter Yaworsky).

2014-2017   PI: The Upper Southern Nasca Region Hillforts Project.

2017   Training program in osteological methods. Forensic Anthropology Center, University of Tennessee, Knoxville.

2015-2016   PI: The Upper Southern Nasca Region Hillforts Project.

2014   Crew member for the Yamobamba Excavation Project. Supervisor: Patricia Chirinos.

2014   GIS database editor, Central California Information Center. Supervisor: Lynn Gamble, PhD.

2013   Co-PI: Household Maize Beer Production in the Andes: An Ethnoarchaeological Investigation.

2013   Field-technician for the Wari Road Survey Project. Supervisor: Matt Edwards, PhD.

2012   Co-PI: Household Maize Beer Production in the Andes: An Ethnoarchaeological Investigation. Preliminary scouting trip.

Grants and Awards Received

2023-in-prep   PI: National Science Foundation (SAR): "An Archaeological investigation of the resiliency of coupled human-environmental systems in Grand Staircase Escalante National Monument." $252,000.

2023-pending   PI: National Science Foundation (SAR): "Evaluating the deep time relationships between climate change, population dynamics, and warfare in the Prehispanic central Andes." $258,117.

2021   PI: National Science Foundation (SPRF-FR) Social Behavioral and Economic Postdoctoral Research Fellowship (# 2104456): "Evaluating the Climatological, Political, and Demographic Drivers of Conflict: An Archaeological Case Study." $138,000.

2019   The Brian Fagan Fund: $500.

2019	Co-PI: National Science Foundation (DDRIG) Doctoral Dissertation Research Improvement Grant (# 1934521): "Evaluating the impacts of warfare on a Late Intermediate period population in the southern Nasca region." $20,000.
2019	Broom Graduate Student Research and Travel Grant: $1,850.
2019	Department of Anthropology Graduate Student Research Grant: $1,800.
2018	Charles J. Erasmus Fund: $1,175.
2018	Department of Anthropology Graduate Student Research Grant: $800.
2017	Charles J. Erasmus Fund: $1,000.
2017	Department of Anthropology Graduate Student Research Grant: $1,021.
2016	Humanities and Social Sciences Research Grant: $3,000.
2016	Department of Anthropology Graduate Student Research Grant: $1,000.
2015	Department of Anthropology Graduate Student Research Grant: $4,300.
2013	Co-PI: University of Utah Research Committee grant: $5,000.

Federal Research Grants

2022	Bureau of Land Management, "Archaeological Survey of Cottonwood Wash, San Rafael Desert, Emery County, Utah." Cooperative Agreement L20AC00267, Grant Number 13090284. Brian F. Codding (PI), Jerry D. Spangler (Co-PI), Kate E. Magargal and **Weston C. McCool** (Senior Personnel), Kenneth B. Vernon, Kasey Cole, Kurt M. Wilson, and Ishmael Medina (graduate researchers) (12/1/20-- 6/30/22; $18,698).

Internal Fellowships

2019	One-quarter fellowship from the dean's discretionary block grant for 2019-2020: $7,425 (Fall Quarter)
2018	UCSB Anthropology Graduate Fellowship: $6,425 (Fall Quarter)
2017	UCSB Anthropology Graduate Fellowship: $6,425 (Winter Quarter)

Teaching

Teaching Experience
Teaching Associate

Human Osteology (ANTH 180B), Spring 2019. University of California, Santa Barbara
Human Evolution (ANTH 121), Winter 2018. University of California, Santa Barbara
Human Evolution (ANTH 121), Spring 2017. University of California, Santa Barbara
Human Evolution (ANTH 121), Spring 2016. University of California, Santa Barbara

Teaching Assistant
Introduction to Biological Anthropology (ANTH 5), University of California, Santa Barbara
- Spring 2020 (head TA)
- Winter 2020 (head TA)
- Fall 2017
- Fall 2016
- Fall 2015
- Fall 201
Intro to Biocultural Anthropology (ANTH 7), University of California, Santa Barbara
- Winter 2014
Introduction to Cultural Anthropology (ANTH 2), University of California, Santa Barbara
- Winter 2016
- Winter 2019
- Spring 2014
- Fall 2013
Introduction to Archaeology (ANTH 3), University of California, Santa Barbara
- Spring 2015
Introduction to World Prehistory, University of Utah
- Spring 2013
- Fall 2012

Teaching Interests
Introduction to Anthropology, Introduction to Archaeology, World Prehistory, Statistical Analysis, The Archaeology of Warfare, Spatial Analysis and GIS, Latin American Prehistory, North American Prehistory, Climate Change and Human History, Bioarchaeology, Osteology, Human Evolution, Human-Environment Interactions, Human Ecology in Anthropology.

Conference Presentations

2022   Richard George, **Weston C. McCool**, Douglas J. Kennett, SAA organized session: Archaeology with altitude: Papers in honor of Mark Aldenderfer. Presentation: Modeling climate-population-conflict relationships in the Maya and Nasca regions.

2022   Elizabeth Arkush, **Weston C. McCool**, Ryan Smith, SAA organized session: Leveraging radiocarbon in the central Andes: From chronologies to research agendas. Presentation: The Late Intermediate period in the south-central Highlands: Key problems in timing.

2022   Kenneth B. Vernon, Jerry Spangler, Brian F. Codding, **Weston C. McCool**, Peter M. Yaworsky, SAA organized session: The influence of climate change on diet, demography,

and climate. Presentation: Resilience to climate change among Farmers in the Basin-Plateau region.

2022   Kurt M. Wilson, Brian F. Codding, **Weston C. McCool**, Daniel Contreras, Joan Brenner Coltrain, SAA organized session: The influence of climate change on diet, demography, and climate. Presentation: Climate change drives 7,000 years of dietary variation in the central Andes.

2022   **Weston C. McCool**, Brian F. Codding, Kenneth, B. Vernon, Kurt M. Wilson, Peter M. Yaworsky, Norbert Marwan, Douglas J. Kennett, SAA organized session: The influence of climate change on diet, demography, and climate. Presentation: Divergent climactic and demographic stressors predict high rates of morbidity in the Prehispanic central Andes.

2022   **Weston C. McCool** and Kurt M. Wilson, Co-Chair of SAA organized session: The influence of climate change on diet, demography, and conflict.

2021   Beth Scaffidi and **Weston C. McCool**. EAA organized session: Earth, water and fire: approaching living habitat and community landscape management. Presentation: Violence-related trauma and social conflict at pre-Hispanic Andean cities vs. the outlands: insights from bioarchaeological big data.

2021   **Weston C. McCool**, Amy Anderson, Joan Brenner-Coltrain, and Douglas J. Kennett. Recent archaeological research in Nasca, invited talk: Patterns and Process: mapping out conflict, complexity, diet, disease, and demography in the Nasca highlands during the Late Intermediate period (1000 – 1450 C.E.).

2021   **Weston C. McCool** and Kate Magargal, Co-chair of SAA organized session: Life is risky: human behavioral ecology approaches to variable outcomes.

2021   **Weston C. McCool**. SAA organized session: Life is Risky: human behavioral ecology approaches to variable outcomes. Presentation: Examining trade-offs between food acquisition and violence avoidance: population-level effects and variability in risk-preference.

2019   **Weston C. McCool**. Sesquicentennial of the Colorado River Exploration Expedition Conference. Presentation: The deep history of the Colorado River Basin.

2019   **Weston C. McCool**. SAA annual conference. Poster: Inferring the Character of Conflict using Victim Profiles and Trauma Distributions: A case study from the Late Intermediate period Nasca highlands.

2018   **Weston C. McCool**. SAA organized session: Comparative perspective on warfare. Paper: Regional defensive strategies and chronic warfare in the Nasca highlands.

2017   **Weston C. McCool**. SAA annual conference. Poster: Coping with Conflict: Defensive strategies and chronic warfare in the Prehispanic Nasca region.

2017   **Weston C. McCool**, 2017. UCSB Anthropology Graduate Colloquium. Coping with Conflict: Defensive strategies and chronic warfare in the Prehispanic Nasca region.

2017   **Weston C. McCool**. Institute of Andean Studies annual conference. Poster: Optimizing defense: Assessing the relationship between fortification investment and settlement accessibility.

2016   **Weston C. McCool** and Peter M. Yaworsky. California Workshop on Evolutionary Social Sciences. Poster: Fremont defensive strategies in Nine Mile Canyon, Utah.

2016   Peter M. Yaworsky and **Weston C. McCool**. Utah Professional Archaeological Council Annual Conference. Poster: Functionality of Fremont tower structures in Nine Mile Canyon, Utah.

2015   **Weston C. McCool**. SAA annual conference. Poster: A potential oxygen isotope signature of maize beer consumption: An experimental pilot study.

2014   **Weston C. McCool**. SAA annual conference. Paper: Household maize beer production in the Andes: An ethnoarchaeological investigation.

2014   Matthew Edwards and **Weston C. McCool**. Institute of Andean Studies Annual Meeting. Poster: Wari and Inca roads of the Pampas Galeras.

2013   **Weston C. McCool** and Bradley J. Parker. University of Utah History Conference. Paper: Alcohol and Society: An ethnoarchaeological investigation.

Service

Society for American Archaeology Program Committee Volunteer, 2022.

Undergraduate intern coordinator, Kennett Biogeochemistry Isotope Lab, Dept. of Anthropology, University of California, Santa Barbara.

Brown Bag Colloquium coordinator, Dept. of Anthropology, University of California, Santa Barbara.

Social Chair, Dept. of Anthropology, University of California, Santa Barbara.

Volunteer, graduate student preview weekend, Dept. of Anthropology, University of California, Santa Barbara.

Invited Speaker: University of Utah Anthropology Colloquium Speaker Series. The relationship between resource availability and human violence: An evolutionary perspective.

Invited Discussant: 15th Biennial Conference of Science and Management for the Colorado Plateau and Southwest Region: John Wesley Powell and reimagining the Colorado River Basin: Sesquicentennial perspectives: Native American Panel.

Guest Lecturer, Introduction to Environmental Studies and Sustainability, 2022. Environmental Studies Program, University of Utah.

Guest Lecturer, Archaeological Methods, 2018, 2019, 2020. Dept. of Anthropology, University of California, Santa Barbara.

Guest Lecturer, Archaeological Theory, 2019, 2020. Dept. of Anthropology, University of California, Santa Barbara.

Guest Lecturer, California and Great Basin Indians, 2021. Dept. of Anthropology, University of California, Santa Barbara.

References

Dr. Brian Codding, Professor, Department of Anthropology, University of Utah. brian.codding@anthro.utah.edu

Dr. Douglas Kennett, Professor, Department of Anthropology, University of California, Santa Barbara. kennett@anth.ucsb.edu

Dr. Amber VanDerwarker, Professor, Department of Anthropology, University of California, Santa Barbara. vanderwarker@anth.ucsb.edu.